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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,671	12/21/2001	Daniel T. Colbert	11321-P011C1D2	1673

7590 05/25/2004
Hugh R. Kress
2400 Bank One Center
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Houston, TX 77002

EXAMINER

LISH, PETER J

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 05/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/027,671	Applicant(s) COLBERT ET AL.	
	Examiner Peter J Lish	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 84-102, 109-113 and 141-144 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 84-96 and 109-113 is/are allowed.
- 6) ☒ Claim(s) 97-102 is/are rejected.
- 7) ☒ Claim(s) 141-144 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to the rejections of claims 84-96 have been fully considered and are persuasive. It is considered that the strength of sonication necessary to disperse single-walled nanotubes into solution is not effective in cutting and untangling the nanotubes. The rejections of claims have been withdrawn.

Applicant's arguments with respect to the rejections of claims 109-113 have been fully considered and are persuasive. It is considered that it would not be obvious to one of ordinary skill at the time of invention to treat single-walled nanotubes under nitric acid, given the teaching of treating multi-walled nanotubes under such conditions. It is additionally noted that treating single-walled nanotubes under conditions identical to those used to treat multi-walled nanotubes has been known to destroy the single-walled nanotubes.

Applicant's arguments with respect to the rejections of claims 97-102 have been fully considered but they are not persuasive. Applicant argues that Kiang et al. does not teach a method of cutting wherein defects are formed. However, Kiang et al. teaches the formation of small ripples, or defects, in the walls of the nanotubes that increased until the nanotubes broke, or were cut.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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Claims 97-102 are rejected under 35 U.S.C. 102(a) as being anticipated by Kiang et al. (“Structural Modifications of Single-Layer Carbon Nanotubes”).

Kiang teaches the process of electron beam heating, or annealing, of single-walled carbon nanotubes. Defects, such as small ripples in the walls, are created by electron beam heating and are increased until the cutting of the nanotubes by electron beam heating occurs. Occasionally, the tubes were segmented, or cut, into sections. Note that claim 99 does not require the reflux of the nanotubes in concentrated nitric acid because claim 98, to which it depends, does not require the step of reflux. Kiang additionally teaches that single-walled nanotubes have defects in the graphene sheet structure that allow the tubes to bend, buckle, and distort. These defects occur during manufacture when the tubes are tangled with each other, such as is the case of the produced nanotube samples.

Allowable Subject Matter

Claims 141-144 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 84-96 and 109-113 are allowed.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Lish whose telephone number is 571-272-1354. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

PL



STUART L. HENDRICKSON
PRIMARY EXAMINER